

# Chapter 53

## Engine Performance and Driveability



Name \_\_\_\_\_

Date \_\_\_\_\_

Instructor \_\_\_\_\_

Score \_\_\_\_\_

**Objective:** After studying this chapter, you will be able to explain and locate typical engine performance problems.

1. What five vehicle issues are considered an engine performance problem?

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2. Any problem that affects the performance of the \_\_\_\_\_ powertrain is often referred to as a(n) \_\_\_\_\_ problem.

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### Locating Performance Problems

3. A(n) \_\_\_\_\_ approach, or a(n) \_\_\_\_\_ diagnostics involves \_\_\_\_\_ using your knowledge of automotive systems and a logical process of elimination. \_\_\_\_\_

4. To locate the root cause of failure, identify the \_\_\_\_\_ component or \_\_\_\_\_ part at fault. \_\_\_\_\_

- \_\_\_\_\_ 5. A service manual troubleshooting chart provides all of the following, *except*:

- (A) accurate information.
- (B) information on problem causes.
- (C) information for all makes and models of vehicles.
- (D) information on problem corrections.

6. \_\_\_\_\_ are published by the auto manufacturers and explain problems that frequently occur in one make or model vehicle. \_\_\_\_\_

7. Name two other sources of service information that can be used when a problem is difficult to locate and correct.

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\_\_\_\_\_

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## Typical Performance Problems

- \_\_\_\_\_ 8. Technician A says a no-crank problem occurs when the starter fails to turn the crankshaft. Technician B says a no-crank problem occurs if there is an internal engine part failure. Who is right?
- (A) A only.
  - (B) B only.
  - (C) Both A and B.
  - (D) Neither A nor B.

9. If the starter spins but the engine does not turn over, what is the *most likely* cause?

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10. What is the first step in diagnosing a no-start problem?

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11. When diagnosing a no-start problem, how do you check for fuel?

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12. When diagnosing a no-start problem, by checking for \_\_\_\_\_ the presence of \_\_\_\_\_ and \_\_\_\_\_, you have narrowed down the cause of the problem to two major engine systems. \_\_\_\_\_

- \_\_\_\_\_ 13. All of the following conditions can keep an engine from starting, *except*:
- (A) jumped timing chain or belt.
  - (B) carbon buildup.
  - (C) excessively low compression.
  - (D) slow cranking speed.

- \_\_\_\_\_ 14. Which of the following can cause hard starting?
- (A) Engine mechanical problem.
  - (B) Vacuum leak.
  - (C) Sensor problem.
  - (D) All of the above.

15. Define *stalling*.

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Name \_\_\_\_\_

16. Name three causes of engine stalling.

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17. Engine \_\_\_\_\_ is a performance problem resulting from \_\_\_\_\_ one or more spark plugs failing to ignite and burn their air-fuel charges to produce normal combustion power.

18. What are the four general causes of engine misfiring?

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\_\_\_\_\_ 19. Technician A says an engine misfire can damage the catalytic converter and pollute the environment. Technician B says, if an engine only misfires at idle, no catalytic converter damage will result. Who is right?

- (A) A only.
- (B) B only.
- (C) Both A and B.
- (D) Neither A nor B.

20. What is OBD II engine misfire monitoring?

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21. Type \_\_\_\_\_ misfires are severe enough to cause catalytic converter damage.

\_\_\_\_\_ 22. A misfire rate of less than \_\_\_\_\_% is acceptable because the catalytic converter can easily handle the amount of pollutants the misfire would cause.

- (A) 1
- (B) 2
- (C) 3
- (D) 4

23. Summarize what a scan tool readout of misfire data values may tell you.

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24. What is the purpose of keeping a misfire history?

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25. What is the difference between misfire *passes* and misfire *failures*?

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\_\_\_\_\_ 26. An OBD II scan tool can provide you with which of the following misfire data values?

- (A) Misfiring cylinder.
- (B) RPM at misfire.
- (C) Load at misfire.
- (D) All of the above.

\_\_\_\_\_ 27. Two technicians are discussing OBD II misfire monitoring. Technician A says an OBD II scan tool can identify the primary and secondary misfiring cylinders. Technician B says an OBD II scan tool can calculate the average number of misfire failures recorded during the last 200 crankshaft revolutions. Who is right?

- (A) A only.
- (B) B only.
- (C) Both A and B.
- (D) Neither A nor B.

\_\_\_\_\_ 28. When an engine accelerates quickly up to highway speeds at full throttle, engine load would be around \_\_\_\_\_% of maximum allowed for reciprocating assembly longevity.

- (A) 50
- (B) 75
- (C) 80
- (D) 90

29. List common causes of rough idle.

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30. A vacuum leak will usually produce a(n) \_\_\_\_\_ sound, \_\_\_\_\_ and engine roughness will usually smooth out when engine is revved up above \_\_\_\_\_ rpms. \_\_\_\_\_

Name \_\_\_\_\_

- \_\_\_\_\_ 31. Engine hesitation is usually caused by \_\_\_\_\_ as engine speed increases.  
 (A) advanced ignition timing  
 (B) a temporarily rich air-fuel mixture  
 (C) excessive exhaust back pressure  
 (D) a temporarily lean air-fuel mixture
32. (Stumbling/Surging) \_\_\_\_\_ is a condition where \_\_\_\_\_  
 engine power slowly fluctuates up and down.
33. (Stumbling/Surging) \_\_\_\_\_ is a condition in which the \_\_\_\_\_  
 engine repeatedly loses power and causes a jerking  
 motion of the car upon acceleration or highway cruising.
- \_\_\_\_\_ 34. Technician A says that incorrect ignition timing can cause backfiring. Technician B says that  
 exhaust system leakage can cause backfiring. Who is right?  
 (A) A only.  
 (B) B only.  
 (C) Both A and B.  
 (D) Neither A nor B.
- \_\_\_\_\_ 35. Technician A says dieseling can be caused by high idle speed. Technician B says dieseling can be  
 caused by high octane fuel. Who is right?  
 (A) A only.  
 (B) B only.  
 (C) Both A and B.  
 (D) Neither A nor B.
36. Define the term *pinging*.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
37. Name two things that can cause pinging.  
 \_\_\_\_\_  
 \_\_\_\_\_
38. \_\_\_\_\_ occurs when the fuel is overheated, forming air \_\_\_\_\_  
 bubbles that upset the air-fuel mixture.
- \_\_\_\_\_ 39. Technician A says that fuel line freeze is caused by the use of alcohol and other fuel additives.  
 Technician B says that fuel line freeze is caused when moisture in the fuel turns to ice. Who is  
 right?  
 (A) A only.  
 (B) B only.  
 (C) Both A and B.  
 (D) Neither A nor B.
- \_\_\_\_\_ 40. Which of the following would be the *least likely* cause of poor fuel economy?  
 (A) Lean air-fuel mixture.  
 (B) Incorrect ignition timing.  
 (C) Engine miss.  
 (D) Fuel system leak.

41. Name two things that can reduce engine power.

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42. *True or False?* In most cases, the visual and physical engine/system checks to diagnose performance problems, as well as the problem symptoms, are similar for both gasoline and diesel engines.

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43. What scan tool information will help a technician find the root cause of a diesel performance issue?

## Vacuum and Pressure Gauge Test

44. What is the difference between a *pressure gauge* and a *vacuum-pressure gauge*?

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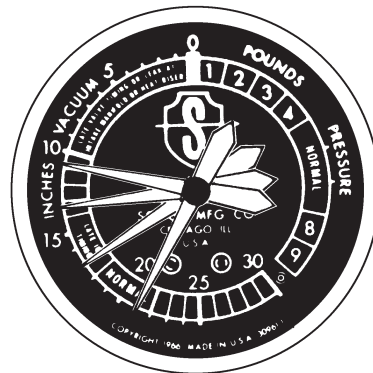
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45. Since vacuum diaphragms are made of \_\_\_\_\_, they are a common source of performance problems.

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\_\_\_\_\_ 46. The vacuum gauge shown on the right is normal at idle, but fluctuates excessively at higher speeds. Which of the following is the *most likely* cause?

- (A) Sticking valve.
- (B) Burned valve.
- (C) Weak valve spring.
- (D) Worn valve guides.



47. A vacuum gauge that slowly drops to zero when engine speed is high indicates a(n) \_\_\_\_\_.

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\_\_\_\_\_ 48. Two technicians are looking at the vacuum gauge shown on the right. The gauge is 3–9 inches below normal at idle. Technician A says this reading may be caused by leaking intake gaskets. Technician B says this reading is caused by a poor air-fuel mixture. Who is right?

- (A) A only.
- (B) B only.
- (C) Both A and B.
- (D) Neither A nor B.

